

XLIII. REVISION OF THE ORIENTAL LEPTIDÆ.¹

By E. BRUNETTI.

The present paper is an endeavour to recognise the described Oriental species in this family and to add some new ones existing in the Indian Museum collection. Some of these latter bear names by Bigot (apparently *nomina nuda*), with "sp. nov." affixed, and these I have described herein. Most of them are placed wrongly, generically, and one "sp. nov." which he calls "*Leptis dichroma*" is a *Plecia* (*Bibionidæ*) and is in too dilapidated a condition to describe. My thanks are due to Mr. C. O. Waterhouse of the British Museum for some valuable information respecting some of Walker's types and Rondani's genus *Leptipalpus*, and also to Prof. M. Bezzi for notes on the latter genus.

SURAGINA, Wlk.

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|------------------------------|----|----|----------|
| 1. <i>illucens</i> , Wlk. | .. | .. | Celebes. |
| 2. <i>signipennis</i> , Wlk. | .. | .. | Gilolo. |

Walker mentions the great length of the discal cell ("nearly six times longer than broad") as characteristic of his genus, and Osten Sacken notes its affinity with *Atherix* (Berl. Ent. Zeits., xxvi, 101); as Walker had labelled with the generic name *Suragina*, the specimen which Osten Sacken makes the type of his species *Atherix limbata*. The latter author seemed doubtful of the validity of *Suragina*. Osten Sacken does not mention the proportionate shape of the discal cell in his *limbata*. In the five species of *Atherix* that I have been able to examine it is only from 3 to 4 times longer than broad, and in the two common European species (*marginata* and *ibis*) only slightly over 3 times. (In my measurement, I have regarded the "breadth" as its breadth in the middle—or the average breadth.)

Failing a comparison with types, it is well to let *Suragina* stand provisionally. Moreover Walker says the antennæ have the third joint round, whereas in *Atherix* it is kidney-shaped.

From the descriptions, *S. illucens* is a cinereous black species, with two large lateral testaceous spots at the base of the abdomen, the tip of which is also testaceous; whilst in *S. signipennis* it is black, with hoary tomentum. The legs are differently coloured, but the size of both species is about identical.

¹ Since concluding this and the succeeding paper, I have seen two new species of *Chrysopilus*, two of *Bombylius* and one of *Geron*, all acquired by the Indian Museum: these will be described shortly.—E. Brunetti.

ATHERIX, Mg.*Table of Oriental species.*

- A Abdomen with distinct red or yellow markings.
- B Hind femora without a distinct ring near tip.
1. All the femora wholly reddish tawny .. *nigritarsis*, Dol.
 2. Basal half of all the femora black.
Basal half of abdomen all tawny: wings with distinct, wide brown stripe in middle .. *calopa*, mihi, sp. nov.
Abdomen mainly black, but base at sides reddish tawny: wings pale brown with indistinct darker band in middle .. *lanopyga*, mihi, sp. nov.
 3. All femora wholly black, except base of "posterior" femora .. *labiata*, Big.
- BB Hind femora brownish yellow, with a broad brown ring before the tip *limbata*, Os. Sac.
- AA Abdomen practically all black: at most a bluish grey band at base, or first segment pale yellow.
- C Abdomen with bluish grey transverse band towards base: hind metatarsi normal *cincta*, mihi, sp. nov.
- CC Abdomen with first segment pale yellow: hind metatarsi distinctly and uniformly thickened .. *metatarsalis*, mihi, sp. nov.

Atherix limbata (?), Os. Sac.*Redescription.*

(Plate xii, fig. 4, ♀, wing.)

♀. Lower Burma. Long. 8 mm.

Head.—Vertex cinereous grey with a few blackish hairs, upper half of frons dull coal-black, lower part bluish grey with (seen from above) a central small black spot, lower part of face blackish grey, proboscis brown. Antennæ blackish grey with a few hairs at base, third joint tawny, arista long. Eyes blackish. Back of head bluish grey, with a fringe of light hairs, which are longest behind the sides of the eyes. Palpi black, hairy below.

Thorax.—Dorsum aënous black, the colour not attaining anterior margin except as a wide stripe in the centre, but extending to both wings and to the scutellum. Humeral calli tawny, with a whitish grey tomentose spot, contiguous to each, on the anterior border. A bluish grey spot in front of each wing, placed almost on the dorsum. Sides of thorax yellowish grey posteriorly; mesopleuræ bluish grey. Scutellum yellow, base blackish; metanotum blackish grey.

Abdomen.—Brownish yellow, with a black dorsal stripe on first three segments, which spreads out over the greater part of the fourth and fifth segments, tip of abdomen yellow, sides with a blackish line and a fringe of black hairs mixed with some paler ones. Belly yellowish. Some short pale hairs over the dorsal surface of the abdomen.

Legs.—Fore coxæ yellowish with bluish grey reflections, posterior coxæ blackish, all of them black at the junction with the femora, which are yellow, with the tips narrowly black, the middle pair having a very small black streak on the under side near the base, and the hind pair a wide black ring in the middle. Remainder of legs black, but middle tibiæ dark brownish yellow.

Wings.—Pale grey, a rather dark brown middle stripe from the centre of the costa, narrowing posteriorly and reaching hind margin of wing at tip of anal cell; distal part of wing dark grey, down to the fifth posterior cell, the centre of which is pale grey (reaching to the border) but a rather wide pale grey space remains between the dark brown stripe and the distal dark grey part, this clearer part ceasing at the fifth posterior cell. Fifth longitudinal vein dark brown suffused. Wing rather strongly iridescent. Upper transverse vein placed just before one-third of the discal cell. Halteres yellowish, knob black.

Described from a single perfect ♀ in the Indian Museum collection captured by Dr. Annandale.

N.B.—I describe under the above specific name a ♀ specimen (now in the Indian Museum collection) captured by Dr. Annandale at the base of the Dawna Hills, Amherst District (Lower Burma), on 1-iii-08, and which I at first thought was a new species. It differs from *limbata*, O.S., by the presence of the clearer space in the dark distal part of the wing, and by the hind femoral band being in the middle, not near the tip; other minor differences hardly being specific. My augmented description may enable others to identify it definitely either as *limbata* or as new.

A. nigritarsis, Dol.

A. limbata, Os. Sac.

A. calopa, mihi, sp. nov.

The two former are very closely allied, as noted by the late Baron Osten Sacken (Berl. Ent. Zeits., xxvi, 100) in describing his species from the Philippines. My *calopa* is also near both, yet I believe all three species to be distinct.

Atherix lanopyga*, mihi, sp. nov.(Chrysopila lanopyga*, Bigot, *nom. nud.*)**(Plate xii, fig. 3, ♀, full insect.)**

♀. Assam. Long. 10 mm.

Head.—Rather more than the upper half of frons velvet-black, remainder of frons, the vertex, and face below antennæ, blackish, with bluish grey reflections. Antennæ, two basal joints brown (third missing). Eye facets of uniform size. Proboscis and palpi blackish, the latter pubescent above and below. Back of head blackish grey with a continuous fringe of short grey hair.

Thorax.—Black, with whitish grey reflections at the sides and on the humeri. Scutellum black, with black hairs; posterior border brown.

Abdomen.—Mainly black. First segment dark brown, the colour extending as a wide dorsal stripe across the second; sides of first two segments occupied by a large, light yellow translucent spot. Third segment velvet-black, with a bicoloured spot at the sides of the posterior border, the anterior half of this spot being orange, and the posterior half grey; the orange colour extending along the sides of the abdomen in a streak, until it reaches the large translucent side spots in front of it. Remaining segments black, whitish grey posteriorly, the sides of the sixth and seventh being light orange-brown. Anal process black. Dorsum of abdomen with yellowish hair, which at the tip becomes brown. Belly yellow, with soft, yellow hair, the middle segments with some irregular black marks.

Legs.—Coxæ brown, with bluish white shimmer, and soft, silky white hair; femora yellow, base of fore pair and basal half of middle and hind pairs, light brown; tibiæ brownish yellow, hind pair darker; tarsi brownish black. The femora have a little pale yellow hair, which is brown on the tibiæ, bright golden brown on hind pair and black on the tarsi.

Wings.—Pale grey, a faint brown streak from the elongated brown stigma reaches nearly to the posterior border: a small, elongated, clear spot in the middle of the discal and of the fifth posterior cells. Discal cell $3\frac{1}{2}$ times as long as broad. Halteres yellow, knobs black. Tegulæ pale yellow, transparent.

Described from one ♀ in good condition in the Indian Museum collection from Sadiya (Assam).

Atherix calopa*, mihi, sp. nov.(Id. id., Bigot, nom. nud.)***(Plate xii, fig. 2, abdomen, ♂.)**

♂. Assam and Tenasserim. Long. 8 to 10 mm.

Head.—Vertex black; frons blackish with bluish grey shimmer; proboscis and palpi blackish, the latter hairy below.

Antennæ brownish yellow, with a trace of bluish grey dust on upper side of two basal joints. Back of head blackish grey, with a thick fringe of long whitish grey hair which is absent on the upper part. Lower facets of eye barely smaller than upper ones.

Thorax.—Dark brownish black, moderately shining; humeri shining brown; sides of thorax brown, light bluish grey dusted. Scutellum dark brown, with erect brown hairs.

Abdomen.—First four segments mainly yellow, but dark brown at the upper side of the first at the base, and a narrow dark brown dorsal line, with a narrow line at each side of the abdomen; these three lines extending over the four segments. Posterior border of fourth segment dark brown, the colour extending forward in the centre, till it joins the dorsal stripe. Remainder of abdomen dark shining brown, the posterior border of each segment bearing a little bluish grey dust. Belly yellowish. The whole abdomen with moderately long hairs of similar colours to that of the respective parts on which they are placed. Genitalia moderately large, dark brown, shining, with black hairs.

Legs.—Coxæ, dark brownish with bluish grey shimmer; femora yellow, basal third in fore pair, basal half in middle pair and basal two-thirds in hind pair black; tibiæ yellow, knees brown; basal half of tarsi yellow, apical half black. Legs with very short black hairs.

Wings.—Very pale grey, apical half a little darker; discal cell three times as long as broad; no distinct stigma; a brownish irregular streak from the centre of the fore border, reaching to about half way across the wing. Halteres yellow, knobs black; tegulæ blackish with yellow edges.

Described from three ♂♂ in fairly good condition, in the Indian Museum collection. The type is from Sadiya and the others from Tenasserim.

***Atherix cincta*, mihi, sp. nov.**

(Plate xii, fig. 1, wing.)

♀. Assam. Long. 10 mm.

Head.—Frons dull black, bare, the part immediately above antennæ with ash-grey reflections and a few hairs. Vertex blackish, only slightly indented; ocelli dull red-brown. Eyes brown, with a bronze reflection, facets of uniform size. Back of head grey, with a fringe of short, black hairs on upper half, which are replaced by longer, scattered white hairs on lower half. Antennæ dark brown, normal, first joint hairy above only, second joint hairy above and below. Face below antennæ ash-grey; palpi and proboscis cinereous grey, with scattered hairs, the former with some strong black hairs at tip.

Thorax.—Ground colour blackish, with traces of cinereous grey close pubescence, which in perfect examples probably covers all the dorsum and sides; with also some scattered longer hairs over the whole thorax. Scutellum blackish, with scattered yellowish

grey hairs and reddish brown posterior border carrying a fringe of black and grey hairs.

Abdomen.—Shining dark blackish brown, shoulders prominent, forming tawny brown calli with grey hair. The under side of the first segment is in front continued in a yellow scaly process extending downwards till it reaches the hind coxæ. The first and second segments are occupied by a pale bluish grey transverse band, narrowly interrupted in the middle, and extending over the sides to a considerable extent. This band carries pale concolorous hair which is continued along the lower sides of the whole abdomen to the tip. The dorsum is clothed with short black pubescence which, beginning with the third segment, extends round the sides until it meets the line of grey side hairs. A very narrow bluish grey border to the fourth and fifth segments, the extreme edge in the fifth and sixth segments being orange-brown.

Legs.—Blackish brown, minutely pubescent: apical half of all femora and the whole of the middle tibiæ reddish tawny. Some whitish grey hairs below femora; hind tibiæ shortly pubescent, with reddish bronze reflections.

Wings.—Pale grey, apical half pale brownish. No distinct stigma, but an ill-defined rather broad brown band runs from the stigmatic portion of the costa towards the posterior border, but fades away before reaching it. Discal cell three times as long as broad; anal cell closed just before the border. By a strong convergence of the veins the fourth posterior cell (*termin*, O.S.) is almost closed; thus (if a stable specific character) separating this species from all other Oriental species in this genus. Halteres yellowish, knobs black, rather large. Tegulæ cinereous grey.

Described from one ♀ from Margherita, and two ♀ ♀ from the base of the Dawna Hills, Amherst District, Lower Burma, the latter taken by Dr. Annandale, 1-iii-08; all in the Indian Museum collection and in good condition.

***Atherix metatarsalis*, mihi, sp. nov.**

(Plate xii, fig. 5, wing; 6, hind leg.)

♂. Lower Burma. Long. 5 mm.

Head.—Vertex small, prominent, with a few bristly hairs; eyes contiguous for a moderate distance, the facets of the lower third much smaller. Antennæ pale yellow, with a few bristles and nearly straight arista. Face bluish grey, palpi black. Lower side of face with some long black hairs. Back of head grey encircled with a row of irregular bristly hairs of different lengths.

Thorax.—Rich shining brown with a semi-livid tinge towards the sides in front; sides with bluish grey reflections. Scutellum concolorous, with a row of minute black bristles on posterior border. Dorsum of thorax with scattered minute black bristles.

Abdomen.—First joint pale yellowish with a few black hairs and bristles; remainder shining black. Dorsum of second with a slight

pale yellowish tinge; whole abdomen with black bristly hairs. Belly black, pale yellow at base; genitalia black, hairy, apparently in three pieces, moderately prominent.

Legs.—Pale brownish yellow, posterior coxæ shining brown, middle femora brownish except at base and tip, hind femora with distal half dark brown; hind tibiæ dark brown, hind metatarsi much thickened. All the legs shortly pubescent, the hairs being softer and longer below the femora and shorter and more bristly on the tibiæ (especially the hind pair) and tarsi.

Wings.—Clear, with three distinct broad dark brown bands from the costa towards the hind margin: the first beginning at the basal cross-veins, filling one-half of the basal cells, and one-third of the anal cell, thence disappearing; the second is rather narrower and in exactly the middle of the wing, reaching from the costa almost to the hind border but leaving a narrow clear margin; this band encloses the inner cross-vein and nearly fills the basal half of the discal cell; the third is joined on the costa to the second by the stigma, extends nearly to the tip of the wing, leaving a narrow clear margin, and reaches the posterior border, filling the whole of the second, third and fourth posterior cells. Stigma very dark brown, filling all the cell as far inwards to just above the origin of the third longitudinal vein. Halteres rather long and prominent, pale yellow; clubs black, elongated.

Described from a perfect unique specimen taken by Dr. Annandale on the Dawna Hills (2—3,000 ft.), 2—3-iii-08. In the Indian Museum collection. A very distinct species, and with the appearance of a *Chrysopilus*.

LEPTIS, Fab.

Leptis apicipennis, mihi, sp. nov.

(Plate xii, fig. 7, wing.)

♀. Assam. Long. 6 mm.

Head.—Frons and face grey dusted, with a large, shining black, inverted heart-shaped tubercle in the middle, and extending on each side to the eyes. Ocelli reddish tawny, semi-transparent, situated on the extreme vertex. First antennal joint bright tawny (rest absent). Proboscis shining chestnut-brown, bare, grey dusted at sides. Palpi large, tawny brown, hairy. Back of head semi-circular, with a weak, irregular fringe of short pale hairs.

Thorax.—Dorsum brown, moderately shining, sides dark greyish. Scutellum yellowish tawny, with a very few short irregular black hairs.

Abdomen.—Tawny with scattered pale hairs: with a blackish brown, dorsal, wide, irregular band which occupies the whole of the last two or three segments; and with a blackish irregular line on the sides of the abdomen.

Legs.—(Middle pair wanting.) Tawny yellow, fore tibiæ yellowish white; hind tibiæ rather brownish, paler towards tip; tarsi tawny brown.

Wings.—Pale grey. A moderately dark brown apical spot begins on the costa in a straight line with the fork of the third longitudinal vein, extends thence to the tip of the wing, and posteriorly until it fills half the first posterior cell, also the whole of the second posterior cell, and then, by bending slightly outwards, the greater part of the third posterior cell.

A brown streak also begins at the inner cross-vein, passes over the basal part of the discal cell, passes longitudinally through the fourth posterior cell, nearly filling it, and spreading over part of the fifth posterior cell also; and on attaining the border, extending each way, meeting on one side the hind part of the apical spot, and extending on the inner side towards the anal lobe of the wing. No distinct stigma. Halteres tawny yellow.

Described from one ♀ in the Indian Museum collection from Margherita. It is in fair condition, except for the absence of part of the antennæ and the middle legs.

N.B.—As Walker's two species of *Leptis* prove to belong to the genus *Chrysopilus* (*decisa* and *impar*), there now remain in this genus only Osten Sacken's *uniguttata*, and my new one.

***Macellopalpus fulvidus*, mihi, sp. nov.**

(*Id. id.*, Bigot, *nom. nud.*)

(**Plate xii**, fig. 8, ♀, head in profile.)

♀. Assam. Long. 10 mm.

Head.—Frons with a deep vertical central groove, terminating before reaching the vertex, on which the three brownish yellow ocelli are very prominent. Frons, just above antennæ, grey dusted, the remainder of it shining black, quite smooth. Face below antennæ, and cheeks, grey dusted. Antennæ brownish yellow, third joint darker, with long arista. Proboscis light brown (tip broken off): palpi blackish brown, lighter at base. Eyes black, facets of uniform size. Back of head bluish grey with fringe of yellow hair, which behind the vertex is replaced by two or three irregular rows of stout black bristles.

Thorax.—Light brown, with sparse, short hair. Sides with a slight yellowish tinge; metanotum lighter. Scutellum light brown. (Though in the unique type the scutellum is bare, there are traces of it having borne bristles along the posterior border; and others, to a less extent, on the dorsum.)

Abdomen.—Light brown, nearly bare; posterior borders of segments narrowly blackish. Belly light brown with a central blackish stripe.

Legs.—Missing, except the coxæ, and the femur and tibia of one hind leg. All these are uniformly light brown, the femur having a very narrow black ring at the base.

Wings.—Pale yellow, costal border darker yellowish brown; stigma brown, distinct. Halteres light brown, with a black spot on upper side of knob.

Described from one specimen in the Indian Museum collection from Sibsagar, in fairly good condition except as regards the legs. Bigot's description of his *flaveolus* is very short, and would apply to the present species, but as he marked *fulvidus* himself as a new species I presume it to be distinct.

N.B.—I am very strongly of opinion that *Macellopalpus* is synonymous with *Leptipalpus*, Rond. (1850), and that *Heliomyia*, Dol., is another synonym, but I allow *Macellopalpus* to stand until the ♂ is known (I have seen no mention of this sex).

It resembles *Leptis* in the large palpi, and *Chrysopilus* in the closed anal cell. If the ♂ is found to have long, thin palpi as in *ferruginea*, Wied. (♂), the three species *C. ferruginosa*, Wied., *M. flaveolus*, Big., and my *fulvidus*, would form a natural group, which would be the *Heliomyia* of Doleschall, erected for his *ferruginea* (= *ferruginosa*, Wied.).

The re-establishment of *Heliomyia* was hinted at by Osten Sacken (Ann. Mus. Gen., xvi, 421), and he also suspected that his *Chrysopila lupina* was congeneric with Wiedemann's species.

The only specimen of *ferruginosa*, Wied., that I have seen is a perfect ♀ taken by myself at Batavia, 5-vii-06; and in this the spatulate palpi seem to separate it from the other species of *Chrysopilus*, and to approximate it to *Macellopalpus*.

Osten Sacken claimed that Schiner was wrong in placing *ferruginosus* in *Chrysopilus*, as although the ♂ has the long thin palpi characteristic of the genus, the spatulate palpi of the ♀ makes the species an abnormal one, and is a sexual character only.

On the other hand, if *Leptipalpus* has long thin palpi in the ♂ and *Macellopalpus* is found to have the same, the former name must be adopted, and in that case the full synonymy of the genus and species would be as follows:—

LEPTIPALPUS, Rond., 1850, Nuov. Ann. d. sci. Bolog., ii, 183.

Heliomyia, Dol., 1857, Nat. Tijd. Ned. Ind., xiv, 402.

Macellopalpus, Big., 1886, Bull. So. Ent. Fr., xlviii.

1. **ferruginosa**, Wied. (*Leptis id.*, Zool. Mag., iii; Dip. Ex., i; and Auss. Zwei., i, 224. *Heliomyia ferruginea*, Dol., loc. cit. ante, pl. vii, 5.)
2. **flaveolus**, Big., 1886. (*Macellopalpus id.*, Big., loc. cit. ante.)
3. **waigiensis**, Big., 1887 (? *Leptipalpus*), Bull. So. Zool. Fr., xii, 108.
4. **fulvidus**, mihi, sp. nov. (*Macellopalpus id.*, Big., nom. nud.)

Leptipalpus waigiensis, Big.

Placed by the author provisionally in this genus, the head in the type specimen being in bad condition. I have not seen the species mentioned since.

Rondani, in erecting the genus in 1850, noted its intermediate character between *Leptis* and *Chrysopilus*, having the palpi and antennæ of the former, with the venation of the latter.

CHRYSOPIILUS, Macq.

Of Oriental species this genus is the best represented in the family, as, including two species of Walker's, removed here from *Leptis*, one new species each by Herr Meijere and Prof. Bezzi, and seven new ones herein described, the total number now amounts to nineteen.

To draw up a satisfactory table of species is very difficult but the following may serve for the present, and at any rate it will show the relative positions of my new species. I have found it impossible to include Walker's two species, *maculipennis* and *guttipennis*, owing to the lines on which I have drawn up my table, as from his descriptions of the wings it is not obvious whether they would come in my group A or AA.

Of *maculipennis* he says, "Wings limpid, with three irregular brown bands; second and third bands broad, connected, adorned with several limpid spots, veins black."

Of *guttipennis* he says, "Wings ample, blackish brown, limpid towards the base and with several limpid spots, some of which are confluent, and form a band across the middle; veins black, yellowish at the base; halteres yellowish, with a black sub-apical band."

Table of species.

- A Wings either distinctly and darkly mottled (*Trypeta*-like) or uniformly dark brown. Long. 3 to 5 mm.
- B Wings mottled.
- C Upper fork of the fourth longitudinal vein, emerging with it from the upper outer corner of discal cell as well-separated veins; outer side of discal cell forming a distinct angle. Long. 3 mm. *albopictus*, mihi, sp. nov.
- CC Above veins emerging practically together from extreme upper corner of discal cell; outer side of discal cell straight. Long. 4 mm. *marmoratus*, mihi, sp. nov.
- BB Wings uniformly dark brown not at all mottled; above veins issue as in *albopictus*, outer side of discal cell with an angle. Long. 5 mm. . . . *luctuosus*, mihi, sp. nov.
- AA Wings never mottled nor dark brown. Either pale grey

yellowish or clear, with or without more or less distinct cross-bands or apical suffusions.

- D Second posterior cell enlarged, and enclosing a very opalescent oblong spot. Long. 7 mm. .. *vacillans*, Wlk.
- DD Second posterior cell (presumably) normal.
- E Cross-band (or bands) on wing with well-defined margins.
- F Apical border of wing clear, two distinct cross-bands. Long. 7-8 mm. *correctus*, Os. Sac.
- FF Apical border of wing darkened, inner cross-band incomplete or indistinct. Long. 7-8 mm. .. *lupinus*, Os. Sac.
- EE Cross-band (or bands) on wing with ill-defined margins, generally indistinct or absent.
- G Black species.
1. Wings pale grey, with brownish band. Long. 10½ mm. *segmentatus*, mihi, sp. nov.
 2. Wings unmarked, except for the stigma. Long. 6 mm. *sauteri*, Bezzi.
 3. Wings cinereous, apical half brownish. Long. 7 mm. *impar*, Wlk.
- GG Yellowish, brownish or tawny species.
- H Stigma blackish brown.
1. Abdomen tawny, with ferruginous marks; wings yellow, mixed with grey, tip infuscated. Long. 8 mm. *ferruginosus*, Wied.
 2. Abdomen tawny, with three black bands; black and stylate towards tip. Long. 10 mm. .. *stylatus*, Wlk.
 3. Abdomen light brown, centre segments lighter; wings brownish, no yellow fore border; under side of face deeper than in *ferruginosus*. Long. 6 mm. *simplex*, Meij.
 4. Abdomen cylindrical, tawny brown; segments with black posterior

- borders. Long. 10-11 mm. .. *frater*, mihi, sp. nov.
5. Abdomen conical, bases of segments blackish. Long. $5\frac{1}{2}$ mm. .. *unicolor*, mihi, sp. nov.
6. Abdomen slender, tawny posterior borders, first three segments with dorsal band, and the greater part of remaining segments blackish. Wings clear, stigma dark brown. Long. 6 mm. .. *stigma*, mihi, sp. nov.
- HH Stigma honey yellow (*insularis*) or (presumably) not distinctly dark (*decisa*).
Mainly yellow. Long. 8 mm. .. *insularis*, Sch.
Mainly black. Long. 9 mm. .. *decisus*, Wlk.

N.B.—*C. ferruginosa*, Wied., may require removing to another genus. (Vide Note under *Macellopalpus fulvidus*.)

C. albopictus, mihi, sp. nov.

(*Leptis albopicta*, Bigot, *nom. nud.*)

(Plate xii, fig. 9, wing.)

♀. Assam. Long. 3 mm.

Head.—Wholly black, front about one-fourth width of head; a vertical indentation just above antennæ, with slight greyish tomentum. Antennæ, proboscis and palpi tawny yellow.

Thorax.—Light tawny brown. Sides sublivid. Scutellum concolorous, with some longish hairs on posterior part.

Abdomen.—Dark brown, conical, posterior borders of segments lighter. Belly dark brown.

Legs.—Tawny yellow; femora and coxæ brighter; tarsi darker.

Wings.—Moderately dark brown, with pale grey patches that take the form of three irregular light bands, commencing at, or just below the costa; of which the first begins just beyond the stigma and terminates posteriorly on reaching the fork of the third longitudinal vein; the second crosses the middle of the discal cell and attains the hind border; the third crosses the second basal and the anal cell, and is merged in the light colour of the base of the wing. The centres and hind borders of the posterior cells are also pale grey. The upper fork of the fourth longitudinal vein emerges from the upper corner of the discal cell as two separate veins; the outer side of that cell forming a distinct angle. Stigma dark brown, proportionately large, and there are traces of yellow just before it and also in the basal cells. Halteres brownish yellow.

Described from a specimen in fairly good condition in the Indian Museum collection from Margherita (middle pair of legs wanting, but are probably coloured like the rest). Quite a distinct species from all others except *marmoratus*.

N.B.—Walker's *guttipennis* must be near this species, but appears distinct, and is larger.

C. marmoratus, mihi, sp. nov.

(*Leptis marmorata*, Bigot, *nom. nud.*)

(Plate xii, fig. 10, wing.)

♂. Assam. Long. 4 mm.

Head.—Vertex much elevated, light brown, the ocelli well separated and very distinct, semi-transparent, with black centres. Eyes light chestnut-brown, upper facets rather large, lower ones very small and much darker brown. Eyes contiguous almost down to the antennæ, the frons receding so much as to be invisible; the inner sides of the eyes (seen from in front), also the face below the antennæ, blackish grey. Antennæ, proboscis and palpi brownish yellow.

Thorax.—Moderately dark brown, with sparse gold-yellow hairs on dorsum; slightly paler at sides, and with concolorous scutellum and metanotum, the former bearing some moderately long brownish hairs.

Abdomen.—Dark brown; second segment, and posterior border of first segment lighter. Belly brown. Whole abdomen lightly covered with brownish hairs.

Legs.—Coxæ light brown. The single leg of the (unique) type (fore leg) is concolorous.

Wings.—Rather dark brown, with pale grey spots, of which the clearest is an oval one just beyond the stigma, reaching from the costa to the fork of the third longitudinal vein. Below this spot, follows a spot in each of the first, second and third posterior cells. There is a small one in the centre of the discal cell, which, with a small one in the fourth posterior cell and a large one in the fifth posterior cell, form a row. A small spot is at the tip of the marginal cell, and a larger one at the tip of the submarginal; whilst the whole posterior border of the wing is pale grey, spreading out somewhat in the cells and in the axillary cell. The veinlets forming the upper fork of the fourth longitudinal vein emerge practically together from the upper corner of the discal cell, the outer side of which is practically quite straight. Halteres light brown with large blackish brown knobs.

Described from one specimen from Sadiya in the Indian Museum collection in fairly good condition, except for the absence of nearly all the legs. I, however, do not hesitate to describe it, as it shows by its mottled wings its distinction from all other Eastern species except *albopictus*.

C. luctuosus, mihi, sp. nov.(Atherix id., Bigot, *nom. nud.*)

♂. Assam. Long. 5 mm.

Head.—Vertex, frons and face blackish; antennæ dark brownish yellow; proboscis and palpi blackish. Back of head blackish, with rather long greyish hair at the sides and below. Eyes bright brown, lower facets much smaller than upper ones.

Thorax.—Mouse colour, nearly bare. Scutellum concolorous with a row of long hairs on posterior border.

Abdomen.—Dark brown, with some yellowish grey pubescence. Belly, dark brown.

Legs.—Coxæ dark brown, with brownish grey hair; femora and tibiæ light brownish yellow, with sparse hair on under side of femora, and a row of minute bristly hairs on outer side of hind tibiæ; tarsi brownish yellow, tips black.

Wings.—Anterior half rather dark brown, the colour gradually fading away posteriorly to the pale brown hind border. Mediastinal cell, nearly to its tip, darker brown, no separate stigma. Upper fork of fourth longitudinal vein issues as two separate veins from the discal cell, the outer side of which thus contains a distinct angle. Halteres pale yellow, knobs black.

Described from one ♂ in the Indian Museum collection from Margherita (slightly damaged, but with the specific characters sufficiently distinct).

C. segmentatus, mihi, sp. nov.

(Plate xii, fig. 11, abdomen; 12, wing.)

♂. Nepal. Long. 10 mm.

Head.—Vertex jet-black, prominent; ocelli small, equidistant, whitish. Eyes very large, occupying practically the whole of the head, lower facets much smaller than upper ones. Whole of face grey dusted. Antennæ tawny. Proboscis large, shining brown, lower part grey dusted; palpi dark brown with some hair. Back of head grey dusted, studded with black hairs.

Thorax.—Dorsum and sides dark blackish brown. Two narrow, longitudinal, yellowish grey stripes on dorsum, dividing the surface into three equal parts, and a silvery grey reflection on the sides, behind the wings (seen from behind). Humeral calli light yellowish brown.

Abdomen.—Shining black, the segments well separated, with a telescopic appearance. Posterior border of first segment shining steel-blue-grey; second wholly black; rest of segments, seen in certain lights, steely ænous, highly shining, with a dull jet-black moderately wide posterior border.

The whole abdomen moderately thickly clothed with soft black hairs.

Legs.—Blackish brown; base of hind femora, tips of four anterior femora, and the anterior tibiæ wholly, pale tawny brown.
✓ *Wings*.—Pale grey; stigma brown but ill-defined, elongated and spread over both mediastinal and sub-costal cells, and from this stigmatic spot, a brownish grey band proceeds posteriorly, rapidly narrowing, and disappears on reaching the outer cross-vein, thus forming what at a short distance appears to be a brown triangular cloud, darkest in front. The lower branch of the upper fork of the fourth longitudinal vein issues from below the middle of the outer side of the discal cell which latter has the appearance of having the upper outer corner cut off by the upper branch.

Described from one ♂ in perfect condition in the Indian Museum collection from Gowchar (Nepal). A very distinct and handsome species.

N.B.—Prof. Bezzi's new species (*sauteri*, ♂ ♀) from Formosa, Takao, 15-iv and 11-v-07, falls next to *segmentatus* in my table, but is of quite a different type to all the other species herein mentioned, belonging to the *aureus*, Mg., group of European species, to which group I can refer no species from a truly Oriental locality. Probably Formosa, and the whole of China also, belongs to the Palæarctic Region.

C. frater, mihi, sp. nov.

(? ♀, *Leptis punctum*, Big., *nom. nud. in litt.*)

♂. Tenasserim. Long. 10-11 mm.

Head.—Vertex and frons black; antennæ brownish tawny, proboscis and palpi tawny; face below antennæ grey: lower facets of eyes slightly smaller than upper ones. Back of head greyish, with white hair behind the eyes, but absent behind the vertex.

Thorax.—Light tawny brown, nearly bare; lower portion at the sides nearly livid. Scutellum concolorous, with traces of being covered with short hairs.

Abdomen.—Light tawny brown with yellowish grey pubescence, and some black hairs intermixed. Posterior borders of segments narrowly black, the colour being rather broader on the last segments. Black hairs adorn the borders of the segments and the tip of the abdomen. Belly similarly marked.

Legs.—Tawny; coxæ with some gold-yellow hair in front; tibiæ mouse-colour, becoming dark brown towards tips; tarsi dark brown.

Wings.—Yellowish grey; apical portion from just before the end of discal cell rather grey, this colour extending slightly along the posterior border. The veinlets of upper fork of the fourth longitudinal vein issue contiguously from extreme corner of discal cell, the outer side of which is quite straight. Stigma dark brown, oval, distinct. Costal cell yellowish. Halteres yellow, knobs brown.

Described from two examples in fair condition from Tenasserim, in the Indian Museum collection.

N.B.—In general appearance considerably like *ferruginosa*, Wied.

A ♀ in the above collection may be the other sex of this species; it is labelled *Leptis punctum*, Big., which is probably only a *nomen nudum*.

C. unicolor, mihi, sp. nov.

(Plate xii, fig. 13, wing.)

♂. Assam. Long. 5 mm.

Head.—Vertex very small, raised, dark brown, ocelli shining, brownish white, semi-transparent. Face grey dusted; antennæ, proboscis and palpi bright tawny brown. Upper two-thirds of eyes rich brown, with large facets; lower third black, with very much smaller facets.

Thorax.—Dorsum, sides and scutellum bright tawny brown, with scattered gold-yellow hairs, and with black hairs on the scutellum.

Abdomen.—Concolorous; bases of segments (except first and second) narrowly brown; the whole abdomen covered irregularly with black hairs, including a row on the posterior border of every segment. Belly concolorous, with black hairs.

Legs.—(Fore pair, except coxæ, missing.) Uniformly bright tawny brown; tarsi darker brown. Legs practically bare.

Wings.—Pale grey, almost clear. Stigma distinct, but with ill-defined edges. A very light brownish band extending from it posteriorly, partly across the wing. Veins tawny brown. Halteres tawny.

Described from one ♂ in good condition in the Indian Museum collection, from Margherita.

C. stigma, mihi, sp. nov.

(Plate xii, fig. 14, wing.)

♂. Lower Burma. Long. hardly 6 mm.

Head.—Vertex reduced to a very small elevated black triangle on the angles of which are the three prominent ocelli. Eyes dark reddish brown, contiguous for a considerable distance, the facets much larger for a considerable space in front above the antennæ, and with a greenish black tinge and (in certain lights) a narrow bright green horizontal stripe across the middle. Face much withdrawn between the eyes; light grey above and below antennæ. Antennæ yellow, third joint blackish with some hairs and a rather long arista, which is microscopically pubescent. Proboscis cinereous grey, lower part tawny yellow; the palpi tawny yellow with tips broadly black and hairy. A fringe of light hairs around the eyes, back of head light grey.

Thorax.—Greenish with a dorsal narrow brown stripe in front and two small indistinct brown spots in middle of dorsum. Sparse

yellow hairs over the whole dorsum. Sides of thorax cinereous grey, yellowish at base of wing. Scutellum grey; centre with a slight greenish tinge.

Abdomen.—Yellowish, first segments blackish grey, segments 2, 3 and 4 with a blackish, rather wide posterior border and dorsal stripe, remainder of segments blackish. Belly yellow, tip blackish. A few yellow hairs scattered over dorsum of abdomen; black hairs at tip. Genitalia bi-lobed, tawny yellow, with stiff black hairs.

Legs.—Coxæ and femora pale yellow, with a few yellow hairs near the tip, on under side of latter, and with generally distributed microscopic black hairs. Tibiæ blackish yellow, with microscopic black hairs and some stronger bristles; tarsi similar, tips black. Middle tarsi with two long spines at tip.

Wings.—Quite clear, stigma distinct, dark brown but without well-defined limits, traces of a pale yellowish stripe towards tip of wing. Inner cross-vein placed before one-fifth of the discal cell; anal cell closed well before wing-border. Halteres yellow, knobs black.

Described from a single perfect ♂ in the Indian Museum collection, taken by Dr. Annandale, 2-iii-08, at the base of the Dawna Hills, Lower Burma.

N.B.—I have observed a character in the wings which may, if constant, assist in determining the species.

The upper branch of the fourth longitudinal vein, forming the upper side of the discal cell, forks in some species absolutely on the extreme outer corner of that cell, the two veinlets springing simultaneously, the outer side of the discal cell being practically quite straight. In this group I find (1) my new species *frater*; (2) a specimen in the Indian Museum collection labelled "*Leptis pallidus*, Bigot, sp. nov.," but which agrees with Schiner's "*insularis*" except for the black third antennal joint and the absence of white spots above the antennæ; and (3) a ♀ in the above collection which would be *ferruginosa*, Wied., except for the long thin palpi, and for this venation, and which specimen I now regard as the probable ♀ of my *frater*, but which bears a label "*Leptis punctum*, Bigot, sp. nov."

A second group is formed by those species in which the veinlets do not spring simultaneously from the corner of the discal cell, but distinctly separately, the lower one sometimes from the middle of the outer side of the discal cell, which side thus always contains an angle. In (1) *marmoratus*, mihi, and (2) *luctuosus*, mihi, the veins start close together yet quite distinctly apart; in (3) *ferruginosa*, Wied., (4) *correcta*, Os. Sac., (5) *albopictus*, mihi, and (6) *unicolor*, mihi, the lower veinlet emerges from distinctly above the middle of the outer side of the discal cell, whereas in the seventh and last species, *simplex*, Meij., this veinlet emerges barely above the middle.

In group 3 is one species only,—*segmentatus*, mihi,—in which the veinlets separate so early as to appear as if the upper one had cut off the upper corner of the discal cell.

These distinctions may appear trivial, and, of course, may not be consistent. In the plate, my first group is unrepresented, but it may be easily recognised. The wing of my *marmoratus* illustrates the first division of my second group, the wing of my *albo-pictus* illustrates the second division of the second group, and Meijere's figure of his *simplex* (Bijd. Dierk., xviii, pl. viii, fig. 15), the third division of the second group. My third group contains only my *segmentatus*. I conclude this paper by a revised catalogue.

LEPTIDÆ.

SURAGINA, Wlk., 1860.

Proc. Linn. So. Lond., iv, 110.

1. *illucens*, Wlk., 1860, loc. cit., 110, ♀ .. Celebes.
2. *signipennis*, Wlk., 1862, loc. cit., vi, 8, ♀ Gilolo.

ATHERIX, Meig., 1803.

Illig. Mag., ii, 271.

1. *nigritarsis*, Dol., 1858, Nat. Tijds. Ned. Ind., xvii, 92 Amboina.
2. *limbata*, Os. Sac., 1882, Berl. Ent. Zeits., xxvi, 100, ♀ Philippines.
— ? *Var.*, pl. xii, fig. 4 (wing).
3. *labiata*, Big., 1887, Bull. So. Ent. Fr. xii, 117.. .. Ceylon.
4. *calopa*, Brun., sp. nov., ♂, pl. xii, fig. 2 (abdomen) Tenasserim.
(*Atherix calopus*, Big., *nom. nud.*)
5. *lanopyga*, Brun., sp. nov., ♀, pl. xii, fig. 3 (full ins.) Assam.
(*Chrysopila id.*, Big., *nom. nud.*)
6. *cincta*, Brun., sp. nov., ♀, pl. xii, fig. 1 (wing) *Id.*
7. *metatarsalis*, Brun., sp. nov., ♂, pl. xii, figs. 5 (wing) and 6 (hind leg) Lower Burma.

LEPTIS, Fab., 1805.

Syst. Antl., 69.

1. *uniguttata*, Os. Sac., 1880, Ann. Mus. Gen., xvi, 422, ♂ .. Sumatra.
2. *apicipennis*, Brun., sp. nov., ♀, pl. xii, fig. 7 (wing) Assam.

MACELLOPALPUS, Big., 1886.

Bull. So. Ent. Fr. (1886), xlviii.

(? Syn. *Leptipalpus*, Rond.)

1. *flaveolus*, Big., 1886, loc. cit., ♀ .. Papua.
2. *fulvidus*, Brun., sp. nov., ♀, pl. xii,
fig. 8 (head, profile) .. Assam.
(*Id. id.*, Big., *nom. nud.*)

LEPTIPALPUS, Rond., 1850.

Nuov. Ann. v. sci. nat., Bologna, ii, 183.

(? *Heliomyia*, Dol.)(? *Macellopalpus*, Big.)

1. (?) *waigiensis*, Big., 1887, Bull. So. Zool.
Fr., xii, 108, ♀ .. Waigoe.

CHRY SOPILUS, Mcq., 1826.

Rec. Trav. Soc. Sci. Lille, p. 82.

1. *decisus*, Wlk., 1857, Proc. Linn. So.
Lond., i, 15, ♂ (*Leptis decisus*) .. Malacca.
2. *maculipennis*, Wlk., 1857, loc. cit., i,
118, ♂ ♀ (*Chrysopila id.*) .. Borneo.
3. *vacillans*, Wlk., 1859, loc. cit., iii, 89,
♂ ♀ .. Aru Island,
Papua.

N.B.—*Vide* Os. Sac., Ann. Mus. Gen., xvi, 420, notes.

4. *impar*, Wlk., 1861, loc. cit., v, 282, ♀
(*Leptis*) .. Batjan.
5. *guttipennis*, Wlk., 1861, loc. cit., v, 282,
♀ (*Chrysopila*) .. *Id.*
6. *stylatus*, Wlk., 1864, loc. cit., vii, 208,
♀ (*C. stylata*) .. Mysol.
7. *insularis*, Sch., 1868, Dipt. Novara
Reise, 199, ♀ .. Nicobar Isles.
8. *correctus*, Os. Sac., 1882, Berl. Ent.
Zeits., xxvi, 101, ♀, fig. 2 (wing)
(*correcta*) .. Philippines.
9. *simplex*, Meijere, 1904, Bijd. Dierk.,
xviii, 97, ♂ .. Java.
10. *sauteri*, Bezzi, 1907, Ann. Mus. Hung.,
v, 564, ♂ ♀ .. Formosa.
11. *albopictus*, Brun., sp. nov., ♀, pl. xii,
fig. 9 (wing) .. Assam.
(*Leptis albopicta*, Big., *nom. nud.*)

12. **marmoratus**, Brun., sp. nov., ♂, **pl.**
xii, fig. 10 (wing) Assam.
 (*Leptis marmorata*, Big., *nom. nud.*)
13. **luctuosus**, Brun., sp. nov., ♂ *Id.*
 (*Atherix id.*, Big., *nom. nud.*)
14. **segmentatus**, Brun., sp. nov., ♂, **pl.**
xii, fig. 11 (abd.); 12 (wing) .. Nepal.
15. **frater**, Brun., sp. nov., ♂ Tenasserim.
 (♀ ? *Leptis punctum*, Big., *nom. nud.*)
16. **unicolor**, Brun., sp. nov., ♂, **pl. xii**,
 fig. 13 (wing) Assam.
17. **stigma**, Brun., sp. nov., ♂, **pl. xii**, fig.
 14 (wing) Lower Burma.

N.B.—The above are most certainly true species of *Chrysopilus*. I am indebted to Mr. C. O. Waterhouse for the examination of Walker's types, thus enabling me to definitely place them in this genus.

18. **ferruginosus**, Wied. (? 1823), Zool.
 Mag., iii, 4 (*Leptis id.*) .. Java, Borneo,
 Celebes, Ter-
 nate.

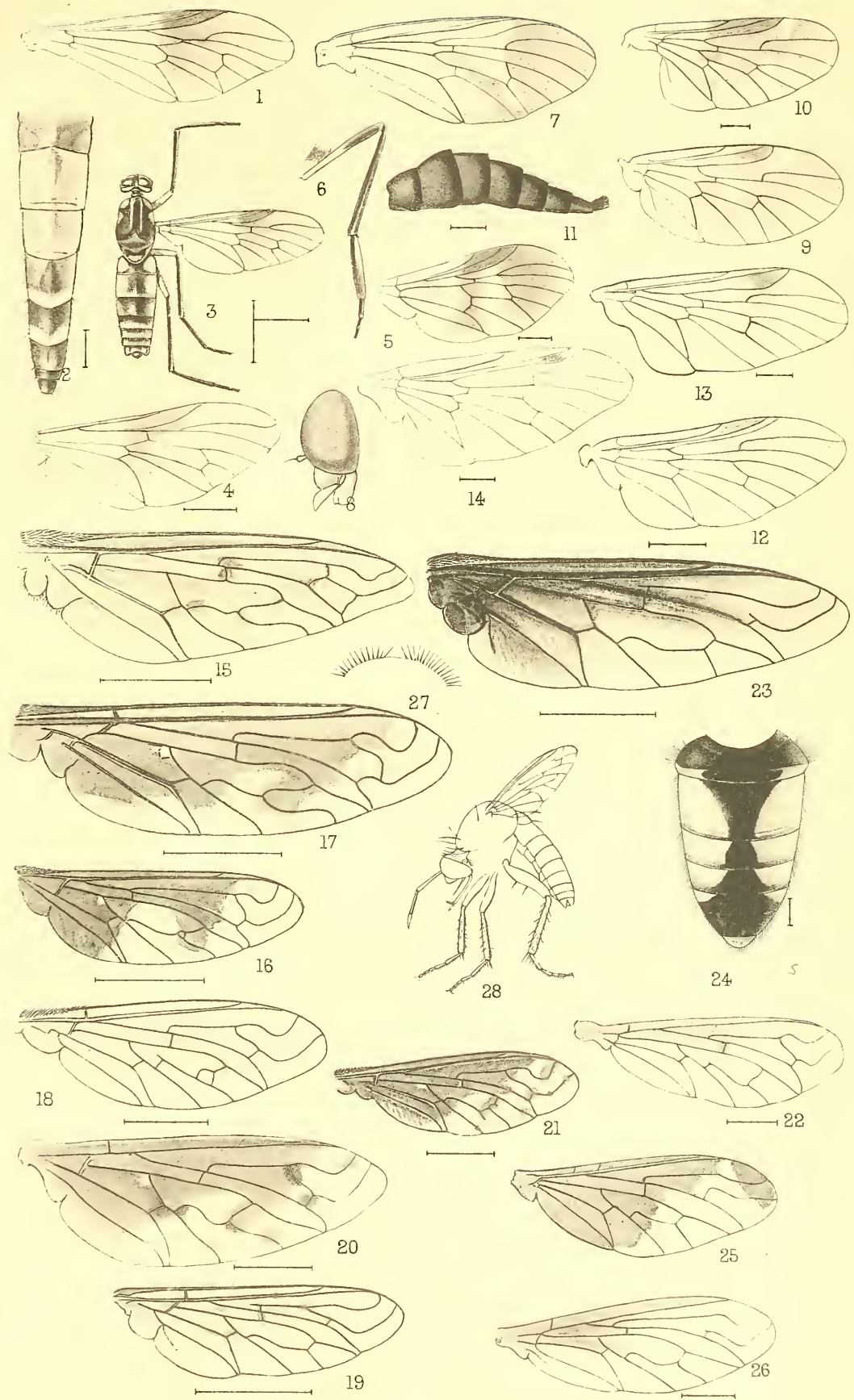
(*Helionymia ferruginea*, Dol., Nat. Tijd.
 Ned. Ind., xiv, 402, pl. vii,
 fig. 5.)

N.B.—This species may require the erection of a new genus and may be congeneric with *lupinus*, O. S. *Vide* note under *Maccellopalpus fulvidus*.

19. **lupinus**, Os. Sac., 1880, Ann. Mus.
 Gen., xvi, 420, ♀ (*lupina*) .. Sumatra.

EXPLANATION OF PLATE XII.

- FIG. 1. *Atherix cincta*, Brun., ♀, wing.
 „ 2. „ *calopa*, Brun., ♂, abdomen.
 „ 3. „ *lanopyga*, Brun., ♀, full insect.
 „ 4. „ *limbata*, Os. Sac., ♀, wing.
 „ 5. „ *metatarsalis*, Brun., ♂, wing.
 „ 6. „ *id.*, hind leg.
 „ 7. *Leptis apicipennis*, Brun., ♀, wing.
 „ 8. *Macellopalpus fulvidus*, Brun., ♀, head in profile
 „ 9. *Chrysopilus albopictus*, Brun., ♀, wing.
 „ 10. „ *marmoratus*, Brun., ♂, wing.
 „ 11. „ *segmentatus*, Brun., ♂, abdomen.
 „ 12. „ *id.*, wing.
 „ 13. „ *unicolor*, Brun., ♂, wing.
 „ 14. „ *stigma*, Brun., ♂, wing.
 „ 15. *Hyperalonia suffusipennis*, Brun., ♀, wing.
 „ 16. *Exoprosopa collaris*, Wied., ♀, wing.
 „ 17. „ *lateralis*, Brun., ♀, wing.
 „ 18. „ *bengalensis*, Macq., ♀, wing.
 „ 19. „ *retrorsa*, Brun., ♀, wing.
 „ 20. „ *annandalei*, Brun., ♀, wing.
 „ 21. „ *insulata*, Wlk., ♀, wing.
 „ 22. „ *brahma*, Sch., wing.
 „ 23. *Argyramæba bipunctata*, Fab., wing.
 „ 24. „ *ceylonica*, Brun., ♂, abdomen.
 „ 25. „ *gentilis*, Brun., ♂ ♀, wing.
 „ 26. *Anthrax*, sp. (Poona), ? ♀, wing.
 „ 27. *Bombylius erectus*, Brun., ♂ ♀, abdominal spines.
 „ 28. *Toxophora javana*, Wied., insect in profile.



D. Bagchi, del.

ORIENTAL LEPTIDAE & BOMBYLIDAE.

Bemrose Lt. Derby